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**DREDGE REHANDLE FACILITY
WATER MANAGEMENT PLAN
December 21,2000**

Purpose

The purpose of this Water Management Plan is to describe the water management activities associated with the operation of the Port of Portland's Suttle Road Dredge Rehandle Facility (DRF) Pilot Project. This Water Management Plan was developed specifically for the January 2001 dredging of Marine Terminal 5, Berth 503 and Marine Terminal 6, Berths 603-605. The information in this plan will be included in the Operation and Maintenance Plan, currently being developed for the DRF.

The DRF is a pilot project constructed to manage dredged material in an upland environment. The dredged material will be placed in the DRF for dewatering; after dewatering, the material will be characterized to determine the appropriate management options and final disposition of the material. Following the characterization for final disposition, the dredged material will be removed from the DRF to allow restored capacity for future dredging activities. Final disposition of the material is likely to be on Port property.

Dredging Permits

Dredging will be performed at the Marine Terminal 5, Berth 503 in accordance with Army Corps of Engineers (ACOE) Permit 071-OYA-1-008760, Division of State Lands (DSL) Permit 2080, and Department of Environmental Quality (DEQ) 401 Water Quality Certification. Dredging at Marine Terminal 6, Berths 603-605 will be performed in accordance with ACOE Permit 96-496, DSL Permit 7391-R and DEQ 401 Water Quality Certification 96-496.

Operation of the DRF will be in accordance with the above permits and a DEQ 401 Water Quality Certification, which is expected to be issued in December 2000.

Dredging Operation

Dredging will be conducted using a clamshell bucket. The barge, containing dredged material, will be transported up the Oregon Slough and anchored near the DRF. The dredged material, before it is transferred into the DRF, will contain inherent water from the dredging site due to the method of dredging. As the dredged material is intended for upland placement, one significant project design objective has been to minimize the introduction of water in the process in order to facilitate dewatering.

The dredged material will be transferred into the DRF using a pipeline and 10''- TOYO submersible agitator-pump. The agitator pump was designed to operate using material with high solids content and low water content. The agitator pump was selected as the means to minimize the volume of the dredge slurry, minimize the volume of return water from the DRF, and maximize the retention time within the DRF. The minimum volumes generated by this specialized pump will allow for a better management of the dredged material.



The TOYO submersible agitator-pump will require 30 to 50% water to operate properly. To achieve this water content, additional water (make-up water) may be introduced to the dredged material. The make-up water will be pumped from the Oregon Slough, in conformance with a state of Oregon Water Resources Department water permit; or will be recycled from the DRF, as described below. Priming the submersible pump at the start of the discharge operation will require 100% water passage, which will introduce additional water. However, because of the short duration time of the priming, there will be minimal effect on the overall water content of the material entering into the DRF.

Dredge Rehandle Facility Design

The DRF is approximately 5 acres. The facility is divided into two "cells:" the primary dewatering basin, which is approximately 4 acres; and the secondary settling basin, which is approximately 1 acres (see attached figure). The facility has been sized to hold all sediment and water from the proposed dredging project within the primary dewatering basin; in order to increase available management options.

A weir, constructed of a half section of corrugated metal pipe with removal boards, is located between the primary basin and the secondary basin on the west side of the DRF. This weir will allow water to be transferred from the primary basin into the secondary basin. The weir boards can be adjusted for water height and settlement time in the primary basin.

A second weir of similar construction is located on the east side of the secondary basin. This weir is connected to a discharge pipe and valve that allows water to be discharged into the Oregon Slough.

Water Management

The dredged material, and any additional river water that is required to operate the agitator pump, will be pumped into the primary basin at the east end. As dredged material is placed into the DRF, the material will flow toward the weir on the west side of the DRF, which separates the primary basin and the secondary basin. Sediments are expected to settle out within the basin as a function of grain size, distance from the discharge line outfall, and elapsed time within the cell. When enough dredged material is placed into the DRF, water will begin to build up against the west weir. As the dredged material flows toward the west weir, the retention time will allow suspended solids to settle. Additional settling time in the primary basin will be controlled by the weir.

The secondary basin will remain empty until the material in the primary basin has had ample retention time. Once acceptable conditions are met, the water from the primary basin will be transferred into the secondary basin. Additional retention time will be available as necessary in the secondary basin to meet 401 Water Quality Certification requirements before discharge into the Oregon Slough.

Elutriate and column settling tests were performed by the Port to determine retention times to meet water quality criteria and expected water quality certification requirements. Based on the *Dredge Material Characterization Study* (Hart Crowser, November 20,

2000) a retention time is expected to be a minimum of 4 days in order to meet expected requirements of the 401 Water Quality Certification.

Although the required retention time in the DRF can be predicted based on the results of these laboratory tests (elutriate and column settling tests), the quality of the effluent will also be confirmed in the field before discharging dredged elutriate to the Oregon Slough. Before the weir boards are removed from the secondary basin, the Port will collect field measurements of turbidity in the secondary basin to ensure that sufficient settling and clarification of the supernatant has occurred.

Optional Water Management Procedure

As an optional water management procedure, water from the DRF will be recycled and used as make-up water. The weir has been designed with a manifold to allow the Port to take water from the secondary settling basin and utilize this water to minimize the introduction of additional river water into the unloading process. Water from the secondary basin will be conveyed to the barge for operations of the agitator-pump, rather than discharge to the Oregon Slough. This optional water management procedure can be used to minimize the additional water introduced to the dredge material to operate the agitator-pump.